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Zambia Institute of Banking & Financial Services

BANKING AND FINANCE DIPLOMA

BF 260: STATISTICAL ANALYSIS

9TH JUNE, 2022 **09:00HRS - 12:00HRS**

TIME ALLOWED: 3Hours + 15minutes Reading Time

INSTRUCTIONS TO CANDIDATES

1. *Answer **ALL 50** questions.*
2. *Each question carries Two (2) marks.*
3. *Statistical Tables are attached at the end of the question paper.*
4. ***FULL CREDIT** will only be given to clearly shown work given to arrive at the correct **FINAL** answer.*

DO NOT TURN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

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6. Which fund has higher risk?
   A. Fund X
   B. Fund Y
   C. Both funds X and Y
   D. None of the above

7. Variance is the square of
   A. Mean deviation
   B. Range
   C. Quartile deviation
   D. Standard deviation

8. If the coefficient of variation of portfolio I is 34% and portfolio II is 20% then portfolio II is more consistent.
   A. False
   B. True
   C. Cannot be determined
   D. None of the above

The table shows the number ofnights people spend at a campsite

Number of nights	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25
Frequency	25	31	37	10	7

Using the given information answer questions 9 to 13.

9. Estimate the mean
   A. 10
   B. 10.4
   C. 10.5
   D. 9

10. Estimate the median
   A. 18.48
   B. 18.84
   C. 19.00
   D. 18.00

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11. What is the modal class?
    A. 21 – 25
    B. 1 – 5
    C. 6 – 10
    D. 11 – 15

12. Calculate the mode.
    A. 12.0
    B. 11.0
    C. 11.9
    D. 9.5

13. Calculate the standard deviation.
    A. 7.03
    B. 49.46
    C. 7
    D. 49

14. A stock of pencils consists of 324 pencils in which 24 are defective, and others are good. A boy went to the shop to purchase a pencil. The shopkeeper randomly draws one pencil and gives it to him. What is the probability that the boy will buy the good pencil?
    A. 0.0741
    B. 0.0714
    C. 0.9259
    D. 0.9529

15. The probability of randomly selecting a rotten mango is 0.09 from the heap of 2000 mangoes. What is the number of rotten mangoes in a heap?
    A. 200
    B. 190
    C. 1820
    D. 180

16. A bag contains 3 red, 4 green and 3 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?
    A. $\frac{1}{3}$
    B. $\frac{2}{3}$
    C. $\frac{7}{10}$
    D. $\frac{3}{10}$

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17. If you roll a pair of dice, what is the probability that one of the dice is a 4 or the sum of the dice is 7?
    A. $\frac{15}{36}$
    B. $\frac{21}{36}$
    C. $\frac{16}{36}$
    D. $\frac{17}{36}$
18. If the occurrence of one event means that another cannot happen, then the events are:
    A. Independent
    B. Mutually exclusive
    C. Bayesian
    D. Empirical
19. A , B, and C are three mutually exclusive and exhaustive events. $P(A) = 3P(B) = 5P(C)$. Find $P(C)$.
    A. $\frac{15}{23}$
    B. $\frac{1}{2}$
    C. $\frac{3}{23}$
    D. $\frac{5}{23}$
20. If the distribution is negatively skewed, then the
    A. Median is to the right of the mode
    B. Mean is more than the mode
    C. Mean is to the right of the median
    D. Mean is less than the mode
21. The probability that X happens is $\frac{1}{4}$, the odd against happening of X are
    A. 1:3
    B. 3:4
    C. 3:1
22. 4:3 If $P(A) = \frac{1}{4}$ and $P(B) = \frac{3}{5}$ and we are also given that the probability of only A occurring is $\frac{1}{7}$. find the probability of only B occurring.
    A. $\frac{3}{28}$
    B. $\frac{69}{140}$
    C. $\frac{1}{7}$
    D. $\frac{1}{2}$

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23. Which among the following is the standard deviation of Binomial distribution?

A. npq

B. $\sqrt{npq}$

C. np

D. nq^2p

24. A lot has 8% defective items. 12 items are chosen randomly from this lot. The probability that exactly two of the chosen items are defective is

A. 0.1853

B. 0.8165

C. 0.1835

D. 0.8156

25. The variance of the distribution given in the table below is

x	0	1
$P(x)$	0.3	0.7

A. 0.35

B. 0.49

C. 0.30

D. 0.21

26. In a box containing 200 bulbs. 20 are defective. The probability that out of a sample of 6 bulbs, none is defective is

A. 0.9469

B. 0.9649

C. 0.0531

D. 0.5314

27. The eggs are drawn successfully with replacement from a lot containing 5% defective eggs. The probability that there is a at least one defective egg is:

A. 0.2824

B. 0.7176

C. 0.9999

D. 0

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28. The Zambia Red Cross says that 16% of the Zambian population has B blood. A blood drive is being held at your college, what is the probability that exactly 2 of the first 10 blood donors have Type B blood?
    A. 0.7144
    B. 0.7414
    C. 0.2586
    D. 0.2856

29. Suppose X is the number of cars per minute passing through a certain road junction between 17 00 hours and 18 00 hours, and X has a poisson distribution with mean 3. What is the probability of observing fewer than 3 cars during any given minute in this interval?
    A. 0.4322
    B. 0.2241
    C. 0.6474
    D. 0.4232

30. Suppose a book of 500 pages contain 50 printing mistakes. Assume that these errors are randomly distributed throughout the book and x, the number of errors per page has a Poisson distribution. What is the probability that 20 pages selected at random will be free of errors?
    A. 0.1353
    B. 0.1335
    C. 0.2706
    D. 0.2076

31. If the coefficient of determination is 0.64, the coefficient of correlation is
    A. 0.4096
    B. Could be either -0.8 or +0.8
    C. Must be positive
    D. Must be negative

32. If $r = 0.8$, coefficient of determination is
    A. 8%
    B. 80%
    C. 64%
    D. 0.8%

33. In regression analysis, if the observed cost value is 60 and predicated cost value is 45, then the error term will be

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A. 105
B. 15
C. 50
D. 60

34. Regression analysis was applied to return rates of bird colonies. Regression analysis was used to study the relationship between return rate (x% of birds that return to the colony in a given year) and immigration rate (y% of new adults that join the colony per year). The following regression equation was obtained

$$\hat{y} = 41.5 - 0.24x$$

Based on the above estimated regression equation, if the return rate were to decrease by 10% the rate the of immigration to the colony would:

A. Increase by 24%
B. Increase by 2.4%
C. Decrease by 0.24%
D. Decrease by 2.4%

Consider the following data which gives test scores and sales made by nine salesmen during the last one year.

Test Scores	15	20	25	22	27	23	16	21	20
Sales(in millions of Kwachas)	32	37	49	38	51	46	34	42	40

Answer questions 35 to 40

35. Compute the sample correlation coefficient

A. 0.9471
B. – 0.9471
C. 0
D. 1

36. The least squares estimate of' a equals

A. - 1.8699
B. 1.8699
C. 0.5578
D. - 0.5578

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37. The least square estimate of b equals
    A. – 0.8699
    B. 0.8699
    C. 0.5578
    D. – 0.5578

38. The sum of squares due to regression (SSR) is
    A. 120
    B. 107.656
    C. 12.344
    D. 38.444

39. The coefficient of determination equals
    A. 0.8971
    B. -0.8971
    C. 0
    D. 1

40. The point estimate of the Test score when Sales are K50 million.
    A. 26.02
    B. 278.89
    C. -1.87
    D. -2.78

41. A nationalized bank has found that the daily balance available in its accounts follows the normal distribution with mean of K550 and a standard deviation of K55. What percentage of saving account holders maintain an average daily balance of more than K500?
    A. 0.3186
    B. 0.8186
    C. 0.1814
    D. 0.6814

42. In a class of 200 students, the mean marks of students in the test you are taking is 10 and their variance is 2. Find the number of students scoring more than 12 marks.
    A. 84
    B. 184
    C. 16
    D. 116

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43. An orderly set of data arranged in accordance with their time of occurrence is called:
A. Harmonic series
B. Time series
C. Arithmetic series
D. Geometric series

44. The most commonly used mathematical method used for measuring the trend is
A. Moving average method
B. Semi average method
C. Method of least squares
D. None of the above

45. Damages due to flood, droughts, strikes, fires and political disturbances are:
A. Seasonal
B. Trend
C. Irregular
D. Cyclical

46. Laspeyre's index is equal to 115, Paasche's index is equal to 106, then Fisher's ideal index is equal to:
A. 115
B. 106
C. 110
D. 100

47. An index number in which the value of any given period is related to the value of its immediately preceding period is a:
A. Value index
B. Chain index
C. Simple relative
D. Fixed index

48. The purchasing power of money is
A. Not equal to the price index number
B. The reciprocal of the price index number
C. Equal to the price index number
D. None of the above

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49. Given below is a summary of ANOVA for six groups of students tested in a research project:

Source of variation	SS(Sum of Squares)	Df(degree of freedom)	MS(Mean sum of Square)
Between Groups	80	5	16
Within Groups	150	18	8.33

What will be the calculated *F* value for the above data?

A. 0.533
B. 0.278
C. 1.921
D. 0.521

50. Which measures is affected most by extreme values?

A. Median deviation
B. Range
C. Quartile deviation
D. Standard deviation

END OF EXAMINATION

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ANSWER ALL 50 MULTIPLE CHOICE QUESTIONS. EACH QUESTION CARRIES TWO (2) MARKS

1. A sample of four executives received the following bonuses last year (K '000): 15, 16, 18, 17.0. Determine the MAD.
   Ⓐ 1
   B. 2
   C. 3
   D. 4

Using the following information, the hourly wages earned by six students are: K10, K15, K12, K8.5, K7.5, K13.5. Answer questions 2 to 4.

2. Calculate the mean
   Ⓐ 11.083
   B. 13.3
   C. 14
   D. 13
3. Calculate the variance
   A. 2.76
   B. 2.67
   C. 7.11
   D. 7.12
4. Calculate the standard deviation
   A. 2.76
   B. 2.67
   C. 7.11
   D. 7.12

Questions 5 to 6 refers to the following data, rates of return over the past 6 years for two mutual funds are shown below.

Fund X	7.3	-5.0	19.8	-6.8	24.5	21
Fund Y	13	- 6.9	5.6	11.3	26.4	2.5

5. Calculate the coefficient of variation for funds X and Y.
   A. 84.1
   B. 81.4%, 79.1
   C. 97.1
   D. 84.1%, 97.1%